

STATE OF ALASKA

Bill Sheffield, Governor

Annual Performance Report for

NOME AREA STUDIES

by

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RESEARCH PROJECT SEGMENT

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Investigations
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Project: F-10-1

Study: S-64 Study Title: ANADROMOUS SALMON
STUDIES

Job: S-64-1 Job Title: Nome Area Studies

Cooperator: Alfred L. DeCicco

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ABSTRACT

A creel census conducted between 29 June and 20 July 1985 on the Nome River indicated that anglers spent 2,190 hours to capture 169 chum salmon, *Oncorhynchus keta* (Walbaum), and 192 pink salmon, *Oncorhynchus gorbuscha* (Walbaum). On the Unalakleet River a creel census conducted in cooperation with the U.S. Bureau of Land Management showed that 237 chinook salmon, *Oncorhynchus tshawytscha* (Walbaum), were captured, of which 81 were killed, during 1,525 hours of angling between 21 June and 10 July. From 1 August through 28 August, 1,538 angler hours produced 963 coho salmon, *Oncorhynchus kisutch* (Walbaum); 674 of these were killed.

Anglers were observed on other streams along the Nome road system, including the Sinuk, Snake, Solomon, Pilgrim, and Niukluk Rivers.

Rearing Dolly Varden char, *Salvelinus malma* (Walbaum), were captured on tributaries of the Nome River crossed by the Beam Road. Tributaries of the Solomon River contained Dolly Varden char and coho salmon.

KEY WORDS

Nome, Unalakleet, creel census, chinook salmon, coho salmon, chum salmon, stream surveys.

BACKGROUND

Nome River Creel Census

The Nome River is located on the south side of the Seward Peninsula. From its headwaters in the Kigluaik Mountains, it flows in a southerly direction for 44 mi before entering Norton Sound at Fort Davis,

approximately 3.5 mi east of Nome at lat.64°29'N, long.160°35'W (Figure 1). Table 1 lists the 17 fish species present in the Nome River (Alt 1979); of these fish, chum salmon, coho salmon, pink salmon, Dolly Varden char, and Arctic grayling, *Thymallus arcticus* (Pallas), are important to the recreational angler. The Nome River provides fish and fishing opportunity for sport, subsistence, and commercial users in the Nome area. Magdanz and Olanna (1984) provide detailed descriptions of past and present use of the lower Nome River. The present status of anadromous fish populations in the Nome River varies with species. While chum salmon runs have been declining over recent years, coho salmon runs are increasing. Pink salmon returns cycle every other year, with even-numbered years providing strong runs and odd years showing very few fish. Chinook salmon are present in very low numbers; Alt (1979) estimated the chinook salmon run at fewer than 20 fish in 1978. During a boat survey on 15 July 1985, only three chinook salmon were seen. Grayling are present throughout most of the river in low numbers. Dolly Varden char spawn and overwinter in the Nome River; the number of fish overwintering varies from year to year, and their availability to anglers depends largely on the length of time they remain in the stream during the spring prior to moving seaward. Instream food availability, ocean-ice conditions, and spawning are the major factors influencing the residency time.

The commercial catch of chum salmon has increased dramatically since the early 1970s. Although not all of the chums caught in this fishery are of Nome River origin, there is a general trend toward a higher incidence of Nome River fish in the catch; more chums have been taken in the Nome subdistrict commercial fishery when the harvest has been high than when it has been low. The average harvest from 1974 to 1983 was 10,375 fish (Schwarz et al. 1983), while the 10-year average from 1964 to 1973 was 1,183 fish (Magdanz and Olanna 1984); the 1984 harvest was 3,744 fish (Schwarz et al. 1984).

Chum salmon escapements in the Nome River averaged 3,100 fish through 1980, but they declined steadily, reaching a low of less than 200 fish in 1983 (Magdanz and Olanna 1984). The 1984 aerial escapement counts showed 2,084 fish (Schwarz et al. 1984), and a small run was forecast for 1985.

Because of increased commercial harvests, active sport and subsistence fisheries, declining chum salmon escapements, and a projected poor return of spawners to the Nome River in 1985, the Alaska Board of Fisheries directed the Sport Fish Division to obtain data on the harvest of chum salmon during the 1985 season. The area of the creel census included the lower 21 mi of the Nome River from the 13 Mile Bridge on the Beam Road to the river's mouth at Fort Davis (Figure 2).

Unalakleet River Creel Census

The Unalakleet River is 65 mi long, drains 2,080 sq mi of the western slopes of the Nulato Hills, and empties into Norton Sound at 63°52'N, 160°32'W (Figure 3). The major tributaries of the Unalakleet River include the South River entering from the south at Mile 3, North River

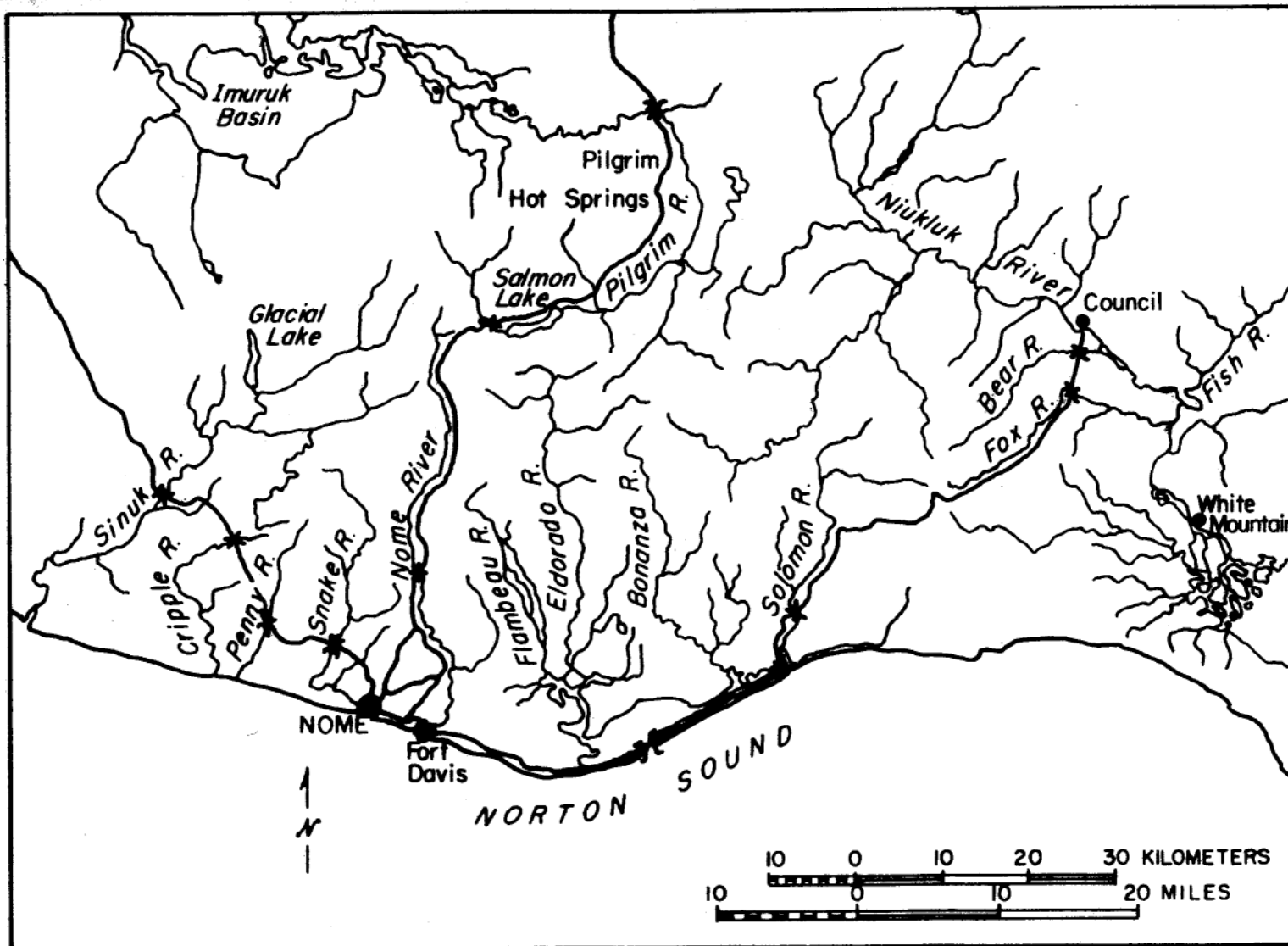


Figure 1. Nome area and roadside streams.

Table 1. Fish species present in Seward Peninsula drainages.

Species	Scientific Name & Author	Abbreviation
Arctic flounder	<i>Liopsetta glacialis</i> (Pallas)	AF
Arctic grayling	<i>Thymallus arcticus</i> (Pallas)	GR
Bering cisco	<i>Coregonus laurettae</i> Bean	BCI
Broad whitefish [*]	<i>Coregonus nasus</i> (Gmelin)	BWF
Chinook salmon	<i>Oncorhynchus tshawytscha</i> (Walbaum)	KS
Chum salmon	<i>Oncorhynchus keta</i> (Walbaum)	CS
Coho salmon	<i>Oncorhynchus kisutch</i> (Walbaum)	SS
Dolly Varden	<i>Salvelinus malma</i> (Walbaum)	DV
Fourhorn sculpin	<i>Myoxocephalus quadricornis</i> (Linnaeus)	FSC
Humpback whitefish	<i>Coregonus pidschian</i> (Gmelin)	HWF
Least cisco	<i>Coregonus sardinella</i> (Valenciennes)	LCI
Ninespine stickleback	<i>Pungitius pungitius</i> (Linnaeus)	NSB
Northern pike [*]	<i>Esox lucius</i> Linnaeus	NP
Pacific herring	<i>Clupea harengus pallasi</i> Valenciennes	PH
Pink salmon	<i>Oncorhynchus gorbuscha</i> (Walbaum)	PS
Round whitefish	<i>Prosopium cylindraceum</i> (Pallas)	RWF
Saffron cod	<i>Eleginus gracilis</i> (Tilesius)	SC
Slimy sculpin	<i>Cottus cognatus</i> Richardson	SSC
Sockeye salmon	<i>Oncorhynchus nerka</i> (Walbaum)	RS

* Not present in Nome River

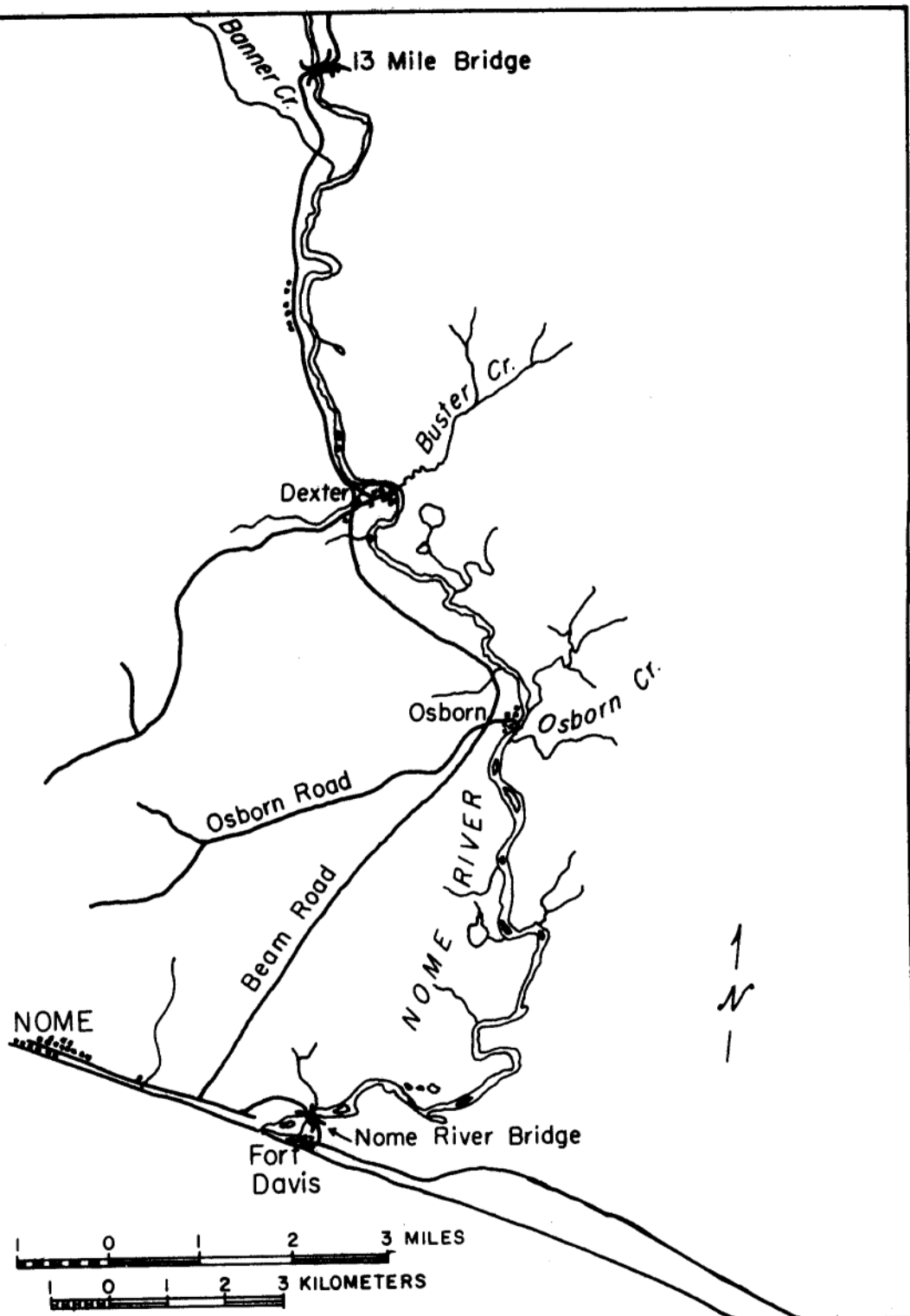


Figure 2. Nome River creel census area.

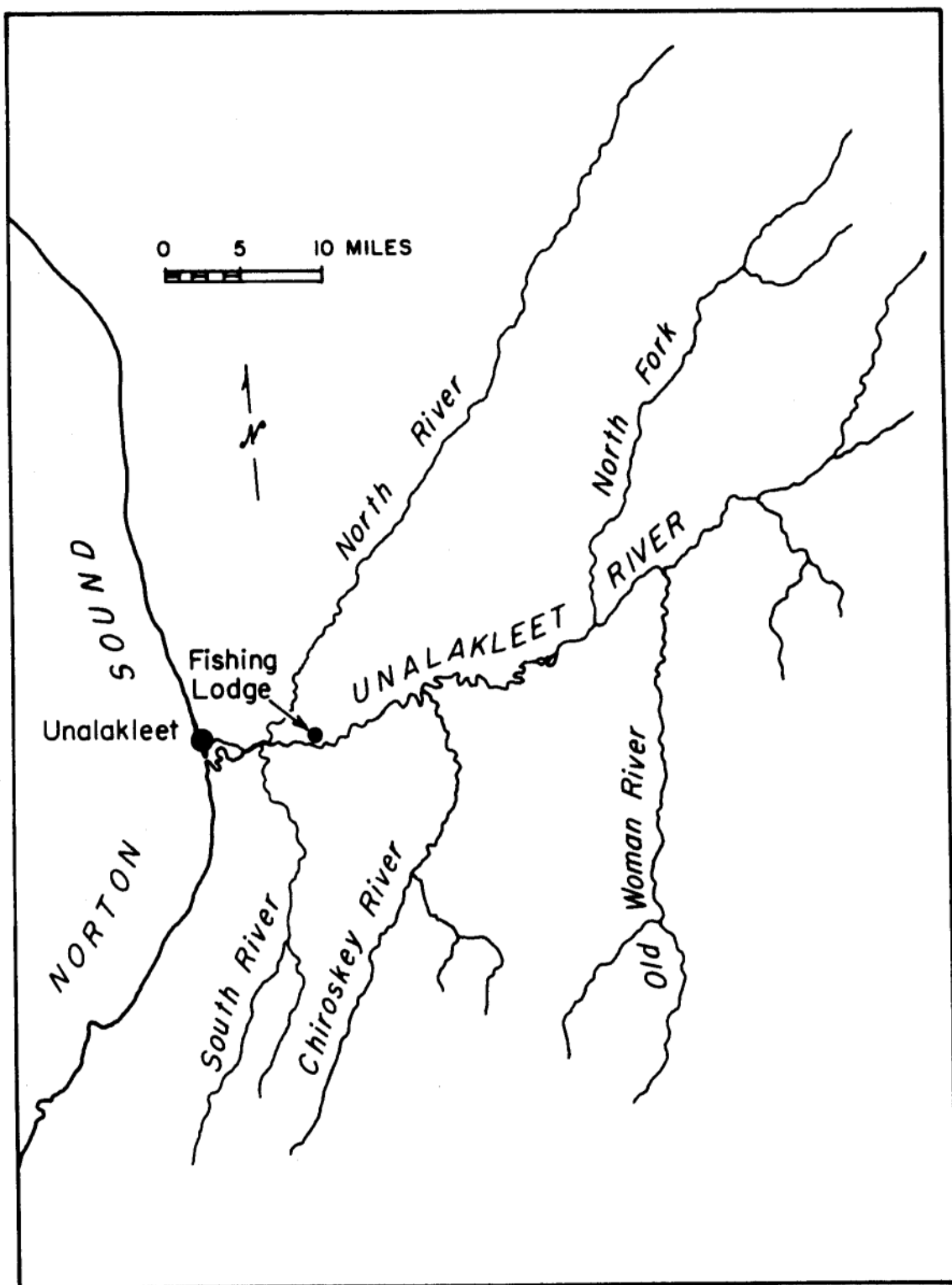


Figure 3. Unalakleet River.

entering from the north at Mile 4, Chirokey River entering from the south at Mile 30, North Fork entering from the north at Mile 60, and Old Woman River entering from the south at Mile 70.

Fish populations in the Unalakleet River support commercial, subsistence, and sport harvests. In 1984 the salmon harvest from the Unalakleet subdistrict included 6,804 chinook, 6 sockeye, 49,904 coho, and 43,317 chum salmon (Schwarz et al. 1985). There was no pink salmon market in 1984. Subsistence anglers from Unalakleet harvested an additional 1,651 chinook, 1 sockeye, 6,675 coho, 17,418 pink, and 3,348 chum salmon.

Local subsistence fisheries also seine Dolly Varden char in the fall of the year; no estimates are available for this harvest. Recreational fishing takes place for all species of salmon, Dolly Varden char, and grayling. There is one sport fishing lodge on the river that caters to nonlocal clients, a guide from the village of Unalakleet also takes out nonlocal sport anglers, and local people sport fish with rod and reel during evenings and weekends.

The U.S. Bureau of Land Management (BLM) administers the river upstream from the Chirokey River as a Wild and Scenic River. In cooperation with the Sport Fish Division, BLM staff conducted a creel census on the Unalakleet River in 1985 to determine the harvests of chinook and coho salmon by recreational anglers. Data were collected by BLM seasonal workers on the main stem of the river and by the Alaska Department of Fish and Game (ADF&G), Commercial Fisheries Division tower crew on the North River. The creel census was designed and analyzed by the Sport Fish Division staff in Fairbanks.

RECOMMENDATIONS

Research

Stream surveys should be conducted in Norton Sound streams to determine distribution and age/length composition of resident fish populations.

Management

1. Creel census on the Nome River need not be conducted in the future because sport harvest estimates are not necessary for in-season management.
2. General trends in distribution of angling effort and the status of resident and anadromous fish populations should be monitored in streams accessible by the Nome road system.
3. The Sport Fish Division should continue to cooperate with BLM if they choose to continue creel census or other fisheries activities in the Wild and Scenic River corridor.
4. Streams targeted for expanding freshwater commercial fisheries in the Norton Sound area should be surveyed to determine the general status of populations to be impacted.

OBJECTIVES

1. To estimate recreational harvest, effort and CPUE in the Nome River for the period 25 June to 20 July 1985, with emphasis on chum and pink salmon.
2. To monitor harvest and usage of other Nome area streams along the road system from 25 June to 20 July 1985.
3. To inventory fish species present in streams of the Nome area that may be impacted by future roadway construction.

TECHNIQUES USED

A statistically based creel census was conducted on the Nome River from 29 June to 20 July 1985 to estimate the angler harvest of chum and pink salmon. Another census was conducted on the Unalakleet River from 21 June through 10 July for chinook salmon and from 1 August through 28 August for coho salmon. Randomly chosen 2-hour time blocks on randomly chosen days were sampled, using a combination of roving angler counts and angler interviews. By traveling in one direction through the fishery, an instantaneous angler count was made; anglers were then interviewed by reversing direction through the fishery until the 2-hour time block had expired. Angler effort was estimated using the instantaneous counts, and harvests were estimated using catch data from angler interviews.

Data were grouped into two strata for the Nome River analysis based on angler effort. Stratum 1 consisted of 8 days, four on each end of the fishery when effort was low and counts averaged 2.25 anglers. Stratum 2 consisted of the intervening 14 days when counts averaged 11.75 anglers. Only interviews representing completed angler trips (n=197) were used in the Nome River analysis.

In the Unalakleet River analysis, data were grouped in two strata; one was composed of weekdays, the other of weekends. Because of the small number of interviews representing completed angler trips, all available interviews were used in the analysis.

Catch-per-unit-effort (CPUE) data were calculated according to von Geldrin and Tomlinson (1973), and harvest data were calculated according to Holmes (1981).

FINDINGS

Nome River Creel Census

Between 29 June and 20 July, 2,190 hours were expended by anglers on the Nome River to harvest 169 chum salmon and 192 pink salmon (Table 2). Angling effort was primarily directed toward the capture of chum and pink salmon, but some grayling and Dolly Varden were also taken. Counts varied from 0 to 28 anglers over the sampling period, peaking over the

Table 2. Creel census summary, Nome River, 1985.

Total Angler Hrs	90% CI	CS Retained	90% CI	CPUE	PS Retained	90% CI	CPUE
2,190	± 355	169	± 77	0.077	192	±78	0.088

Fourth of July weekend; the highest single count (28) was recorded on the evening of 3 July. The mean count for the middle of the season was 11.75 anglers, while the mean count for the 4 days on either end of the sampling period was 2.25 anglers. The mean CPUE was 0.077 fish/hr for chum salmon and 0.088 fish/hr for pink salmon.

Discussion:

Angler effort on the Nome River in 1985 was less than what local people reported as normal. As had been predicted, the chum salmon run was very small; pink salmon abundance was also low. Because both runs were spread out over time, fish were present at very low densities. Anglers would often come to the river and not fish or take only a few exploratory casts to see if "they were in" and then go home if there was no evidence of fish. This low density of salmon influenced both the number of anglers and the length of time spent fishing.

The second factor influencing angler effort in 1985 was the unusually poor weather. Air temperatures remained in the low to midthirties (°F) until early July; fog and rain were common. On 3 July the weather improved markedly and remained quite good until 8 July; from 9 through 20 July the weather was intermittently fair. An apparent correlation existed between angler counts and the weather conditions; the peak counts occurred on 3 July, which was the first day that the weather improved and became warm.

The third factor influencing angler activity is the number of alternative fishing areas within driving distance of Nome. When it became commonly known that few salmon were available on the Nome River, anglers went elsewhere. Although fishing intensity was not documented in other streams in the Nome area, this factor probably accounted for higher-than-normal fishing pressure on the Niukluk, Snake, Sinuk, and Pilgrim Rivers.

Sport fishing for salmon upstream of mile 2 in the Nome River was closed for a 16-day period beginning 26 July 1985; this closure protected fish in spawning areas and reduced the harvest of spawning fish by sport and subsistence fishermen. The lower 2 mi of the Nome River, where most salmon had been taken prior to the closure, remained open to both sport and subsistence users. On 25 July 1985, the 1,565 spawning chum salmon that were counted (Charles Lean, ADF&G pers. comm.) were well below the escapement goal of 2,000 fish; 2,250 pink salmon were also counted. The highest aerial survey count of spawning chums was obtained on 5 August 1985 when 1,868 live chums and 99 carcasses were observed (Charles Lean, pers. comm.).

Other impacts of Nome River area stocks in 1985 included both subsistence and commercial fisheries. Of 66 subsistence permits issued, 51 required questionnaires were returned as of 13 November 1985, indicating that 34 permit holders fished; the total harvests by species follow: 4 chinook, 4 sockeye, 318 chum, 1,120 pink, and 320 coho salmon. The commercial harvest (nine fishermen) from the Nome subdistrict in 1985 consisted of 21 chinook, 6,219 chum, and 356 coho salmon (Charles Lean, pers. comm.).

Unalakleet River Creel Census

From 21 June through 10 July, 1,525 angler hours were expended to catch 237 chinook salmon; 81 fish were retained by anglers (Table 3). The mean CPUE was 0.108 chinook/hr on weekdays and 0.262 chinook/hr on weekends. The mean number of anglers on weekdays was 6.29 anglers/count, and on weekends 7.43 anglers/count. No anglers were observed fishing in the North River during census periods.

From 1 August through 28 August, 1,538 angler hours of effort were expended to capture 963 coho salmon; 674 fish were retained by anglers. The mean CPUE was 0.577 coho/hr on weekdays and 0.723 coho/hr on weekends. The mean number of anglers was 3.67 anglers/count on weekdays and 4.67 anglers/count on weekends.

Nome Roadside Fishery

Rivers adjacent to or intersected by the Nome road system include the Sinuk, Cripple, Penny, Snake, Nome, Grand Central, Pilgrim, Solomon, Fox, Niukluk, Kuzitrin, and Kugarok Rivers (Figure 1). Road-system streams were checked as time permitted during the course of the Nome River creel census (Table 4).

The Kuzitrin and Kugarok Rivers were not checked, and Council was visited once by a game biologist who observed six boats on the Niukluk River. The spot checking of streams showed that angling effort occurred on all streams accessible by road in the Nome area. The amount of angling pressure varies with the relative strength of fish runs, the weather, and accessibility.

Nine Dolly Varden char were sampled from the Sinuk River; their fork lengths ranged from 420 to 585 mm and ages from 5 to 9 years. Four Dolly Varden ranging in fork length from 425 to 480 mm and in age from 5 to 8 years were sampled from the Solomon River.

Grayling samples from angler catches were obtained from three rivers. In the Snake River, 11 grayling ranged in fork length from 355 to 448 mm and in age from 5 to 8 years. There were five grayling from the Pilgrim River that ranged in fork length from 365 to 440 mm and in age from 6 to 8 years. Two large 10-year-old grayling from the Sinuk River that were measured for trophy fish certificates had 510 and 513 mm fork lengths.

Nome Area Roadside Stream Surveys

Tributary streams of the Nome and Solomon Rivers that might be affected by road realignment were surveyed in mid-July with the help of ADF&G Habitat Division. Minnow traps set for one night caught Dolly Varden char, coho salmon, slimy sculpin, ninespine stickleback, and blackfish, while electroshocking captured only Dolly Varden char (Table 5).

The five largest Nome River tributaries having passable culvert installations were sampled using minnow traps; rearing Dolly Varden char were found in all. In addition, slimy sculpins were captured in David

Table 3. Creel census summary, Unalakleet River, 1985.

Species	Hrs Angler	90% CI	Caught Salmon	90% CI	Retained Salmon	90% CI
Chinook [*]	1,525	± 438	237	± 88	81	± 79
Coho ^{**}	1,538	± 340	963	± 320	674	± 158

* 21 June-10 July census period.

** 1 August-28 August census period.

Table 4. Angler checks of Nome Roadside streams, 1985.

Date	River	Anglers Observed	Anglers Checked	Angler Hours	Catch
6/29	Sinuk	4	4	6	10 DV
6/29	Penny	0	-	-	-
6/29	Cripple	0	-	-	-
7/3	Sinuk	2	2	4	4 DV
7/7	Sinuk	6	2	4	60 DV, 1 CS
7/7	Penny	0	-	-	-
7/7	Cripple	0	-	-	-
7/10	Solomon	5	5	7	8 DV, 1 PS
7/12	Snake R.	0	-	-	-
7/13	Sinuk	10-12 (reported by angler at Nome River on 7/14)			-
7/13	Grand Central	0	-	-	-
7/13	Pilgrim R.	7	5	11	12 GR, 6 NP
7/15	Niukluk	6 boats observed		-	-
7/15	Snake	1	1	4	15 GR
7/15	Sinuk	2	2	2	2 DV, 1 GR
7/16	Snake	3	3	6	15 GR, 1 DV

Table 5. Nome area roadside-stream surveys, 1985.

Stream	Tributary to	Species present
<u>Electrofished</u>		
Etta Creek	Solomon River	DV
Orphan Creek	Solomon River	DV
Unnamed Creek	Solomon River	DV
Vinegar Creek	Solomon River	DV
French Creek	Solomon River	DV
Mitchell Creek	Solomon River	DV
<u>Minnow trapping</u>		
Shovel Creek	Solomon River	DV
Jerome Creek	Solomon River	SS, DV, BF, NSB, SSC
Manila Creek	Solomon River	SS, SC, NSB
Side Channel	Solomon River	SC
Basin Creek	Nome River	DV
Sampson Creek	Nome River	DV
Darling Creek	Nome River	DV, PS
Christian Creek	Nome River	DV
David Creek	Nome River	DV, SSC

Creek, and a pink salmon carcass from last year's run was found in Darling Creek. Nome River tributary streams with impassable culverts that were not sampled included Alfield, Rocky Mountain, and Hoodoo Creeks.

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